Ordering number: EN 3936A

Monolithic Linear IC



No. 3936A.

LA7375

Recording and Playback Amplifier for VHS Video Recorders

Overview

The LA7375 is a recording and playback amplifier for VHS-format video tape recorders. It features a two-channel playback amplifier and a single-channel recording amplifier, making it ideal for standard-play mode recorders.

The LA7375 operates from a 5V supply and is available in 16-pin DIPs.

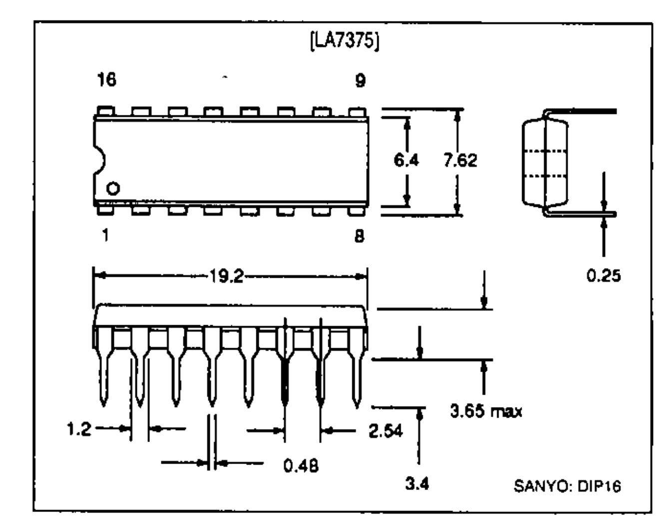
Features

- Two-channel playback amplifier
- Single-channel recording amplifier
- RF envelope detector for automatic tracking
- Constant-current output, high stability recording amplifier
- Automatic gain control
- 5V supply
- 16-pin DIP

Package Dimensions

Unit: mm

3006B-DIP16



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Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC}		7	V
Allowable power dissipation	P_D max	Ta = 65°C	650	mW
Operating temperature	Topr		–10 to +65	°C
Storage temperature	Tstg		–40 to +150	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		5	V
Supply voltage range	V_{CC} op		4.75 to 5.5	V

Operating Characteristics at Ta = 25°C

Playback Mode with SW3 = OFF

Parameter	Symbol	Conditions	Ratings min	Ratings typ	Ratings max	Unit
Supply current	I_{CCP}		23	28	33	mA
Channel 1 voltage gain	G_{VP1}	V_I = 38mVp-p, f = 1MHz	57	60	63	dB
Channel 2 voltage gain	G_{VP2}	V_I = 38mVp-p, f = 1MHz	57	60	63	dB
Gain differential	ΔG_{VP}	$G_{VP1} - G_{VP2}$	–1	0	+1	dB
Input conversion rms noise voltage	V_{NI}	1.1MHz lowpass filter	–	1.1	1.5	µV
Frequency response	ΔV_{FP}	V_I = 38mVp-p, f = 1 to 7MHz	–3.5	0	–	dB
Second-harmonic distortion	V_{HDP}	V_I = 38mVp-p, f = 4MHz	–	–40	–35	dB
Maximum output level	V_{OMP}	f = 1kHz, –30dB harmonic distortion	0.8	1.0	–	Vp-p
Crosstalk	V_{CR}	V_I = 38mVp-p, f = 4MHz, 8.2µH input inductor short-circuited	–	–40	–35	dB
Output DC offset voltage between channels	ΔV_{ODC}		–350	0	+350	mV
AGC input level	ΔAGC	f = 4MHz, TP4 = 250mVp-p	300	330	360	mVp-p
AGC second-harmonic distortion	V_{HDAGC}	V_I = 38mVp-p, f = 4MHz	–	–40	–35	dB
AGC control level	V_{AGC}	f = 4MHz, T4 = 500mVp-p	–	1.0	1.5	dB
		f = 4MHz, T4 = 125mVp-p	–1.2	–0.7	–	
Envelope detector quiescent output voltage	V_{ENVQ}	T12 quiescent, no input	0.47	0.52	0.57	V
Envelope detector output	V_{ENV}	f = 4MHz, T4 = 300mVp-p	2.0	2.25	2.5	V
		f = 4MHz, T4 = 500mVp-p	2.9	3.2	3.5	
		f = 3MHz, T4 = 300mVp-p	1.65	1.9	2.15	
		f = 5MHz, T4 = 300mVp-p	2.0	2.3	2.6	
Playback-ON switch ON resistance	R_{PON}	Measured with 1mA and 2mA DC inputs.	–	6	10	Ω
SW1 threshold level	SW_{RF1}	Channel 1 to 2	1.2	–	1.8	V
		Channel 2 to 1	0	–	0.8	
SW2 threshold level	SW_{RF2}	Channel 1 to 2	3.2	–	4.0	V
		Channel 2 to 1	2.2	–	2.8	

Recording Mode with SW3 = ON

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current	I_{CCR}		50	55	60	mA
Voltage gain	G_{VR}	V_I = 150mVp-p, f = 4MHz	–3.5	–1.5	+0.5	dB
Frequency response	ΔV_{FR}	V_I = 150mVp-p, f = 1 to 7MHz	–2	0	–	dB
Second-harmonic distortion	V_{HDR}	f = 4MHz, V_O = 15mVp-p	–	–45	–40	dB
Maximum output level	V_{OMP}	f = 4MHz, –40dB harmonic distortion	15	20	–	mVp-p
Muting attenuation	V_{MR}	V_I = 150mVp-p, f = 4MHz	–	–45	–40	dB
Intermodulation distortion	V_{CY}	$f_{(T8Y)}$ = 4MHz, $f_{(T8C)}$ = 629kHz, T15A = 150mVp-p, T15 = 40mVp-p	–	–45	–40	dB
Luminance and chrominance mixer voltage gain	G_{MIX}	V_I = 150mVp-p, f = 4MHz	9	11	13	dB
REC switch threshold level	SW_{REC}		3.9	–	5.0	V
REC MUTE threshold level	SW_{MUTE}		2.2	–	4.0	V

Measurement Conditions

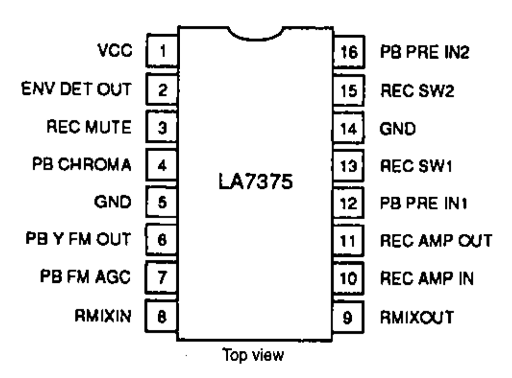
Playback Mode

Parameter	Channel	Test points		Switch positions	
		Input	Output	SW30	Mute
Supple current		T1		1	
Voltage gain, frequency response, harmonic distortion, output level and crosstalk	1	T16	T4	1	
	2	T12	T4	2	
Input conversion rms noise level	1, 2		T4	1	
Output DC offset		PB CHROMA		1 to 2	
AGC input level, AGC harmonic distortion and AGC control voltage		T16	T6	1	
Envelope detector quiescent current			T2	1	
Envelope detector output voltages		T16	T2	1	
Playback-ON switch ON resistance			T11		
RF SW1 threshold		T3			1
RF SW2 threshold		T3			2

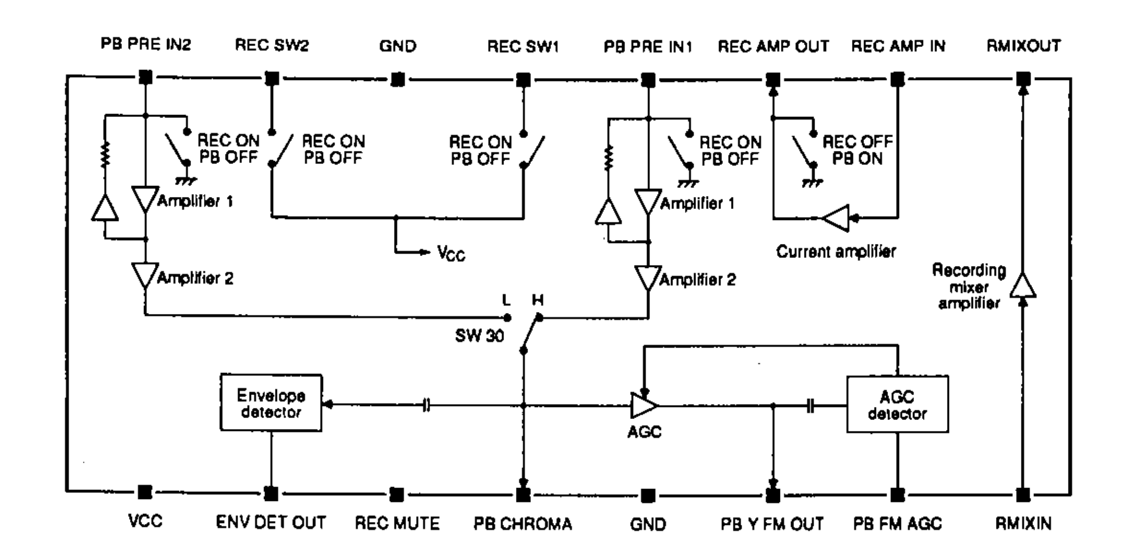
Recording Mode

Parameter	Test points		Switch positions	
	Input	Output	SW30	Mute
Supple current	T1			1
Voltage gain, frequency response, harmonic distortion and output level	T8Y	T15A, T15		1
Muting attenuation	T8Y	T15A, T15		2
Intermodulation distortion	T8Y, T8C	T15A, T15		1
Luminance and chrominance mixer gain	T8Y	T9		1
REC switch threshold	T3			1
REC MUTE switch threshold	T3			2

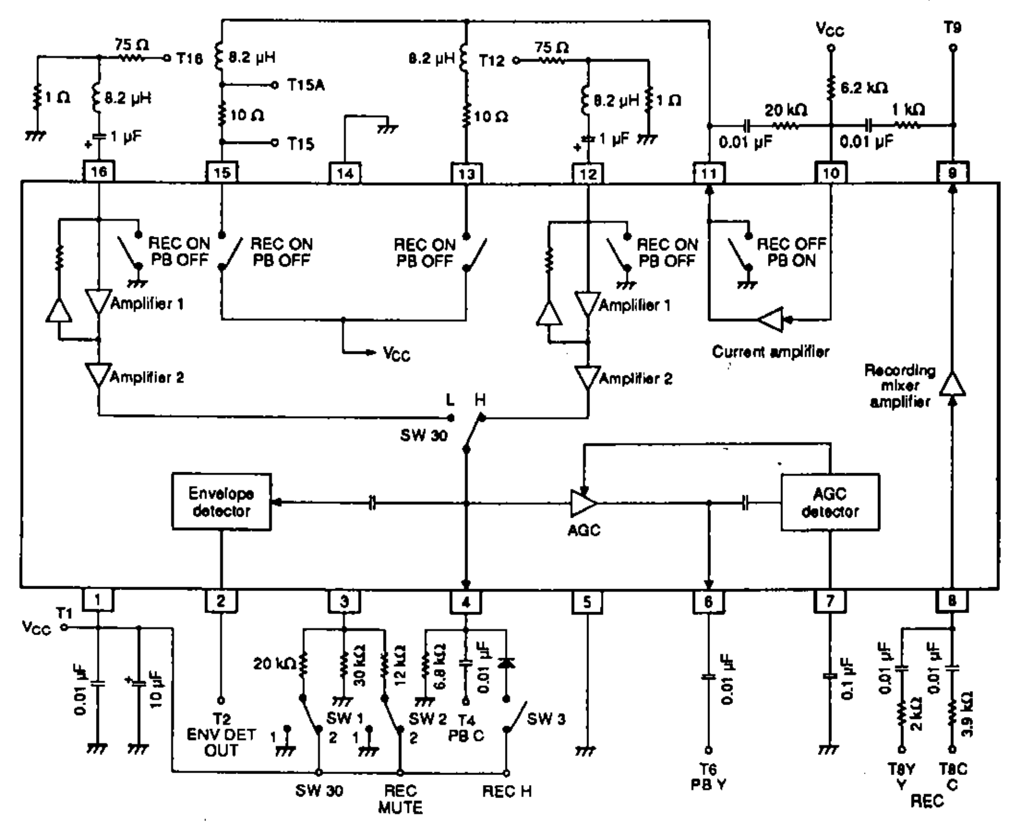
Pin Assignment



Block Diagram

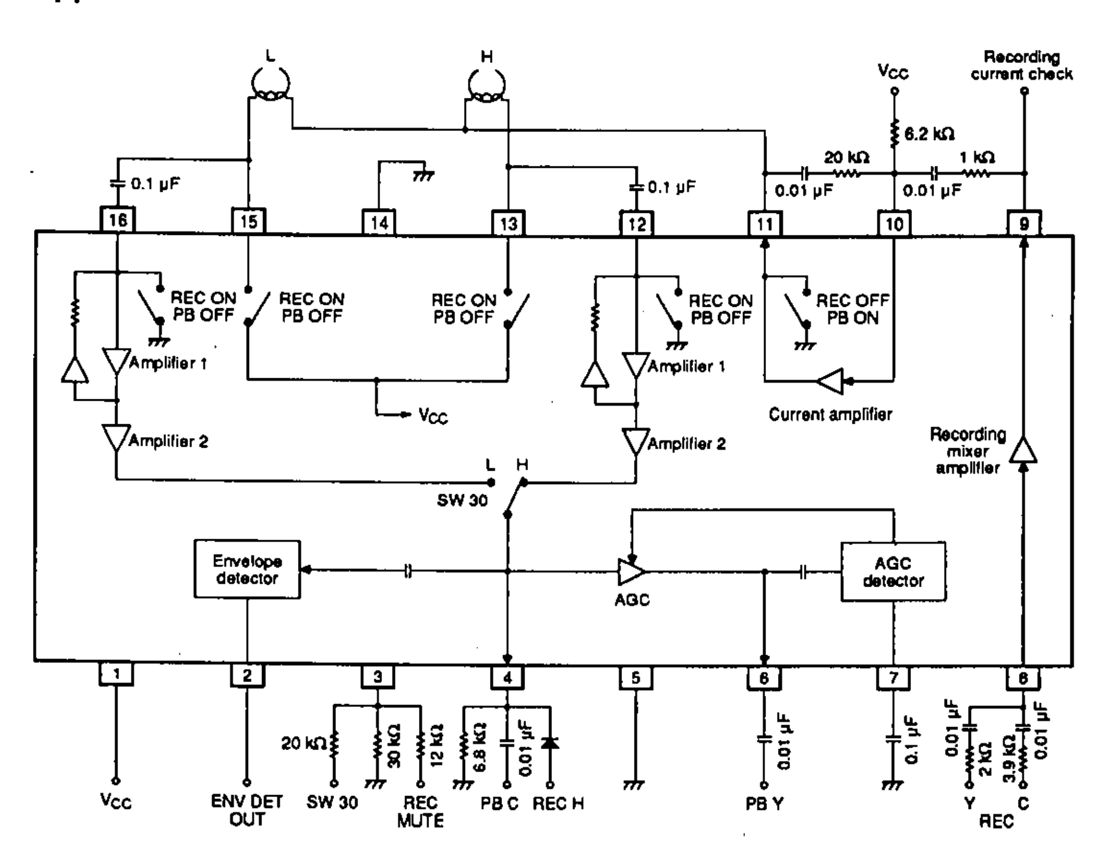


AC Measurement Circuit



Note that the SW30 switch is in the L position when the voltage on pin 3 is 0 to 1V (muting OFF) or 2 to 3V (muting ON), and in the H position when the voltage on pin 3 is 1 to 2V (muting OFF) or 3 to 4V (muting ON).

Typical Application



Pin Functions

Number	Name	Equivalent circuit	Function
1	VCC		5V supply
2	ENV DET OUT		Playback-mode envelope detector output. Nominal voltages are 0.5V (PB with no signal) and 0V (REC).
3	REC MUTE		Muting control and playback SW30 switch control input
4	PB CHROMA		Playback chrominance output. Nominal voltages are 2.0V (PB) and > 3.8V (REC).
5	GND		Ground
6	PB Y FM OUT		Luminance FM output. Nominal voltages are 2.5V (PB) and 4.0V (REC).
7	PB FM AGC		Playback AGC detector output. Nominal voltages are 1.5V (PB) and 0V (REC).
8	RMIXIN		Recording-mode mixer amplifier input. Nominal voltages are 2.1V (PB) and 1.65V (REC). Gain is 11dB when R is 2kΩ, and 6dB when R is 3.9kΩ.
9	RMIXOUT		Recording-mode mixer amplifier output. Nominal voltages are 4.1V (PB) and 1.8V (REC).

Number	Name	Equivalent circuit	Function
10	REC AMP IN		Recording-mode current amplifier input. Nominal voltages are 1.77V (PB) and 1.85V (REC).
11	REC AMP OUT		Recording-mode current amplifier output. Nominal voltages are 0V (PB) and 4.2V (REC). Switching transistor ON resistance is 5Ω.
12	PB PRE IN1		Playback-mode preamplifier input. Nominal voltages are 0.7V (PB) and 0V (REC). Low-noise input transistor.
13	REC SW1		Recording-mode switches. Nominal voltages are 0V (PB) and 4.2V (REC).
15	REC SW2		
14	GND		Preamplifier ground
16	PB PRE IN2		Playback-mode preamplifier input. Nominal voltages are 0.7V (PB) and 0V (REC). Low-noise input transistor.

This catalog provides information as of April, 1995. Specifications and information herein are subject to change without notice.